The National Marine Fisheries Service
National Systematics Laboratory, Washington, DC

1) Most Recent Evaluation of the Lab – None available

2) Brief History and Mission

The National Marine Fisheries Service and the National Museum of Natural History (NMNH) and their predecessors have worked together since 1871 when Spencer F. Baird, Assistant Secretary of the Smithsonian Institution and Director of the U.S. National Museum, was appointed the first U.S. Commissioner of Fish and Fisheries. The National Systematics Laboratory formally originated on 15 August 1942, when Samuel F. Hildebrand moved into the Division of Fishes of the NMNH to continue his ichthyological research for the Department of the Interior's Bureau of Fisheries following the merger of the Bureau of Fisheries fish collection with that of the US National Museum. The NSL, then the National Center for Systematics, was transferred from the Department of the Interior to the newly formed National Oceanic and Atmospheric Administration in 1970 and was renamed the National Systematics Laboratory. Although a national laboratory, NSL is assigned administratively to the NEFSC.

The National Systematics Laboratory conducts research on the taxonomy, systematics, and life history of marine organisms of economic and ecological value to the US. Scientific studies conducted by NSL personnel contribute to the study of marine biodiversity by describing and naming new species, as well as revising existing descriptions, names, and evolutionary systematic relationships based on new information. This information provides a basis for the understanding of the diversity of marine communities and is necessary for proper management of our nation's living marine resources. The NSL is involved currently in studying the taxonomy and diversity of fishes, crustaceans, and cephalopods. We have a permanent staff of four systematists (plus one vacancy), one museum specialist, and a scientific illustrator. Because of budgetary and staffing constraints, our support staff is increasingly comprised of technicians on short-term contracts. In addition, we sponsor visiting investigators, post-doctoral fellows, and student interns. Because the NSL is located in the National Museum of Natural History, we have access to one of the world's leading systems of collections, libraries, equipment, and facilities designed specifically for taxonomic and systematic research. The opportunity to work with other taxonomic experts at the Smithsonian Institution enhances our capabilities to use the latest ideas and techniques in the field. As Smithsonian Research Associates, NSL scientists expand the scientific expertise of the Smithsonian Institution and help build and curate the national collections. Two major responsibilities of the NSL are research and service. Our research produces two principal products: 1) worldwide and regional taxonomic monographs, which are scholarly documents that identify, describe, and catalogue the diversity of marine organisms with commercial or ecological importance; and 2) various aids to identification, including taxonomic keys and descriptions of new species and of the development of known species. These documents provide the information necessary for non-specialists to recognize and to identify marine organisms.

3) Major Customers of the Laboratory

The NSL serves many public and private institutions and individuals worldwide. We provide expert identifications and information for a variety of marine organisms including, but not limited to, the groups we study. We also review and comment upon scientific manuscripts and proposals. In addition to these activities, staff members serve as officers of various scientific societies and participate in university affairs as adjunct professors, teaching university courses and supervising graduate students.

4) Research Summary

Systematics of fishes
Current foci of this work include tunas, billfishes and their systematic relatives and ecological associates, and flatfishes (flounders, etc.).

Systematics of decapod crustaceans
Focuses on crabs, shrimps and lobsters of continental slopes of the western North Atlantic and Gulf of Mexico. This research is currently targeting assemblages associated with deep coral communities.

Systematics of cephalopods
Currently involved in a top-down worldwide revision of cephalopod systematics, studies of deep-sea and polar species, and coordination of studies on inshore squids.

Marine biodiversity

- NSL coordinates the NOAA contribution to the Integrated Taxonomic Information System and has been involved in development of WWW-based presentation of taxonomic information.
- NSL is involved in several NOAA-funded Ocean Exploration projects.
- An NSL scientist has leadership roles in Census of Marine Life.(CoML) projects.
- An NSL scientist represents NOAA on the core team developing a new permanent Ocean Hall exhibit at NMNH (funded largely by NOAA/OE).
- An NSL scientist served on the NMFS working group on Invasive Species, the report of which was incorporated into the draft National Management Plan.

4a) Brief explanation of how research relates to NOAA program areas.

Because taxonomy and systematics is fundamental to all of biology, NSL research relates to all biologically-based NOAA program areas, including Habitat, Corals, Protected Areas, Coastal Resource Management, Invasive Species, Undersea Research and Exploration, Protected Species Management, Fisheries Management, Aquaculture, Enforcement, and Ecosystem Research. In order to collect accurate statistics, develop reasonable national fishing and conservation regulations, set and enforce catch limits, or understand marine communities, it is necessary to know what individual species look like

at all stages of their development, where they are found, and what their relationships are and to name those species consistently.

4b) Geographic Scope of Research

Because many important species and higher taxonomic groups are widespread or migratory, our research is global.

4c) Time frames of Research

Descriptions of individual species may be short-term whereas monographic revisions of major taxonomic groups are long-term; regional faunal studies are medium to long term.

5) Major Accomplishments in the Last 5 Years

A high rate of scientific publications

- The books, Fishes of the Gulf of Maine and Fishes of Bermuda.
- Numerous FAO guides to identification.
- An updated faunal list of decapod crusaceans from US Atlantic waters.
- A paper in Science on remarkable deep-sea squids

Development of WWW-based information system

- Cephalopod sections of the Tree-of-Life.
- Cephalopods at the NMNH, highlighting multimedia and interactivity.

Participation and leadership in Ocean Exploration and Census of Marine Life projects.

An example of cross-cutting research at NSL

Systematics of deep-water animals on the continental slope and New England Seamounts.
Support from and contribution to NOAA's Ocean Exploration program
Contributes to Census of Marine Life projects
Gulf of Maine
Mid-Atlantic Ridge
Includes students from William & Mary/VIMS Deep-Sea Biology class
Collaboration with NEFSC Survey Branch on potential deep-water resources
Collaboration with NEFSC Protected Resources Branch
Distribution of mammals, turtles, and birds
Prey fields for large toothed whales
Collaboration with Oceanography Branch on slope/seamount hydrography
Includes academic collaborators from multiple institutions

6) Legal Mandates

N/A

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